Online Fruit Store

(The Fruit Sellers)

A project Report in partial fulfillment of the requirements for the award of the degree of

Bachelor of Technology

in

Computer Science and Engineering

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<u>Declaration</u>

We hereby declare that the work which is being presented in the project **"**WildRydes (An Online Fruit Store)**"**, in partial fulfillment of the requirements for the project, is an authentic record of our own work carried under the supervision of "**Mr. Neeraj Khanna**".

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This is to certify that the above statements made by the candidates are correct to the best of our knowledge and belief.

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ACKNOWLEDGEMENT

ABSTRACT

The online Fruit store (The fruit Sellers) (Web Application) provides the user a GUI from where fruits can be bought. This in turn will help reduce their time consumption. In addition to this, the Fruit store contains a Nutrition and Dietician Section where a user can find which fruits should he/she buy according to their health conditions. The last and most important feature of the Web App is, it classify a fruit into fresh or rotten, Suppose a user can't recognize a rotten fruit by just looking at it, the app can be used to scan the fruit and predict the correct result.

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1.1 MOTIVATION

The motivation for doing this project was primarily an interest in developing some useful stuff for a common man and for learning something new in the field of Machine learning.

1.2 OBJECTIVE

The main Objective of the project is to create a Web Application that reduce the overhead involved in buying fruits from market and running to Dietician to plan healthy diet.

1.3 SCOPE

The Project can be further extended and can be used in wholesale market where fruits are shipped in mass production and manual segregation of fresh and rotten fruits is difficult. To help this an automated system can be used which automatically separates rotten fruits from the fesh one's.

1.4 WEB APPLICATION

In computing, a **web application** or **web app** is a client–server computer program that the client (including the user interface and client-side logic) runs in a web browser. Common web applications include webmail, online retail sales, online banking, and online auctions. Web applications use web documents written in a standard format such as HTML and JavaScript, which are supported by a variety of web browsers. Web applications can be considered as a specific variant of client–server software where the client software is downloaded to the client machine when visiting the relevant web page, using standard procedures such as HTTP. Client web software updates may happen each time the web page is visited. During the session, the web browser interprets and displays the pages, and acts as the *universal* client for any web application.

1.5 MACHINE LEARNING

Machine learning (**ML**) is the scientific study of algorithms and statistical models that computer systems use to perform a specific task without using explicit instructions, relying on patterns and inference instead. It is seen as a subset of artificial intelligence. Machine learning algorithms build a mathematical model based on sample data, known as "training data", in order to make predictions or decisions without being explicitly programmed to perform the task.[1][2]:2 Machine learning algorithms are used in a wide variety of applications, such as email filtering and computer vision, where it is difficult or infeasible to develop a conventional algorithm for effectively performing the task.

Machine learning is closely related to computational statistics, which focuses on making predictions using computers. The study of mathematical optimization delivers methods, theory and application domains to the field of machine learning. Data mining is a field of study within machine learning, and focuses on exploratory data analysis through unsupervised learning. In its application across business problems, machine learning is also referred to as predictive analytics.

1.5.1 Supervised Learning

Supervised learning is the machine learning task of learning a function that maps an input to an output based on example input-output pairs. It infers a function from labeled training data consisting of a set of training examples. In supervised learning, each example is a pair consisting of an input object (typically a vector) and a desired output value (also called the supervisory signal). A supervised learning algorithm analyzes the training data and produces an inferred function, which can be used for mapping new examples. An optimal scenario will allow for the algorithm to correctly determine the class labels for unseen instances. This requires the learning algorithm to generalize from the training data to unseen situations in a "reasonable" way (see inductive bias).

In this project Supervised learning is used to train the model to classify a fruit into fresh or rotten.

1.5.2 Unsupervised Learning

Unsupervised learning is a type of machine learning that looks for previously undetected patterns in a data set with no pre-existing labels and with a minimum of human supervision. In contrast to supervised learning that usually makes use of human-labeled data, unsupervised learning, also known as self-organization allows for modeling of probability densities over inputs.[1] It forms one of the three main categories of machine learning, along with supervised and reinforcement learning. Semi-supervised learning, a related variant, makes use of supervised and unsupervised techniques.

1.5.3 Reinforcement Learning

Reinforcement learning (**RL**) is an area of machine learning concerned with how software agents ought to take actions in an environment in order to maximize some notion of cumulative reward. Reinforcement learning is one of three basic machine learning paradigms, alongside supervised learning and unsupervised learning.

Reinforcement learning differs from supervised learning in not needing labelled input/output pairs be presented, and in not needing sub-optimal actions to be explicitly corrected. Instead

the focus is on finding a balance between exploration (of uncharted territory) and exploitation (of current knowledge).

1.6 CNN Algorithm

A convolutional neural network (CNN) is a specific type of artificial neural network that uses perceptrons , a machine learning unit algorithm, for supervised learning, to analyze data. CNNs apply to image processing, natural language processing and other kinds of cognitive tasks . A convolutional neural network is also known as a ConvNet.

CNNs are primarily used to classify images, cluster them by similarities, and then perform object recognition. Many algorithms using CNNs can identify faces, street signs, animals, etc.

CNN algorithm consists of different layers:

- **CONVOLUTIONAL LAYER**

  The first layer in a CNN network is the CONVOLUTIONAL LAYER, which is the core building block and does most of the computational heavy lifting. Data or imaged is convolved using filters or kernels.

- **ACTIVATION LAYER**

  Second is the ACTIVATION LAYER which applies the ReLu (Rectified Linear Unit), in this step we apply the rectifier function to increase non-linearity in the CNN. Images are made of different objects that are not linear to each other.

- **POOLING LAYER**

  Third, is the POOLING LAYER, which involves down sampling of features. It is applied through every layer in the 3d volume.

  Typically there are hyper parameters within this layer

  1. **The dimension of spatial extent:** which is the value of n which we can take N cross and feature representation and map to a single value
  2. **Stride:** which is how many features the sliding window skips along the width and height

- **FULLY CONNECTED LAYER**

Lastly, is the FULLY CONNECTED LAYER, which involves Flattening. This involves transforming the entire pooled feature map matrix into a single column which is then fed to the neural network for processing. With the fully connected layers, we combined these features together to create a model. Finally, we have an activation function such as softmax or sigmoid to classify the output.